

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
21 December 2000 (21.12.2000)

PCT

(10) International Publication Number
WO 00/77031 A3

- (51) International Patent Classification: C07K 7/08, 14/47, C12N 15/10, A61P 35/00
- (21) International Application Number: PCT/CA00/00711
- (22) International Filing Date: 15 June 2000 (15.06.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/139,263 15 June 1999 (15.06.1999) US
- (71) Applicant (for all designated States except US): UNIVERSITY HEALTH NETWORK [CA/CA]; Room 7-504, 610 University Avenue, Toronto, Ontario M5G 2M9 (CA).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): GARIEPY, Jean [CA/CA]; 29 Elmsthorpe Avenue, Toronto, Ontario M5P 2L5 (CA). YANG, Shaoxian [CA/CA]; 309-36 Thorncliffe Park Drive, Toronto, Ontario M4H 1J8 (CA).
- (74) Agent: BERESKIN & PARR; 40th floor, 40 King Street West, Toronto, Ontario M5H 3Y2 (CA).
- (81) Designated States (national): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— With international search report.
- (88) Date of publication of the international search report: 19 April 2001
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 00/77031 A3

(54) Title: MUC1 LIGANDS

(57) Abstract: Novel ligands that bind to MUC1 are disclosed. The ligands were isolated using an improved phage display technique using MUC1 tandem repeat as a target. Uses of the ligand to detect, monitor or treat cancer as well as to prepare antibodies is also described.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00711

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K7/08 C07K14/47 C12N15/10 A61P35/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ, CHEM ABS Data, MEDLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	GARIEPY JEAN ET AL: "Identification of short peptide ligands that bind specifically to the breast tumor-associated MUC1 epitope." PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH ANNUAL, no. 41, March 2000 (2000-03), pages 101-102, XP000949494 91st Annual Meeting of the American Association for Cancer Research.; San Francisco, California, USA; April 01-05, 2000, March, 2000 ISSN: 0197-016X abstract --- -/--	1-33

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"A" document member of the same patent family

Date of the actual completion of the international search

28 September 2000

Date of mailing of the international search report

05. 01. 2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel: (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Cervigni, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00711

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 09411 A (CYTOGEN CORP) 28 March 1996 (1996-03-28) Seq Id No 64 abstract; claims; example 6.2; table 7 ---	1-3,8, 15-33
X	MANOUTCHARIAN KAREN ET AL: "Characterization of cerebrospinal fluid antibody specificities in neurocysticercosis using phage display peptide library." CLINICAL IMMUNOLOGY (ORLANDO), vol. 91, no. 1, April 1999 (1999-04), pages 117-121, XP000946486 ISSN: 1521-6616 Phage A12 abstract; table 2 ---	1-3,8-10
A	---	20-26
X	WO 92 18534 A (ANTISOMA LTD) 29 October 1992 (1992-10-29) abstract; claims page 7, paragraph 1; example 3; table 6 ---	1-3, 16-19, 28-33
A	LAING P ET AL: "SELECTION OF PEPTIDE LIGANDS FOR THE ANTIMUCIN CORE ANTIBODY C595 USING PHAGE DISPLAY TECHNOLOGY: DEFINITION OF CANDIDATE EPITOPES FOR A CANCER VACCINE" JOURNAL OF CLINICAL PATHOLOGY,GB,LONDON, vol. 48, no. 3, 1995, pages M136-M141, XP000906851 ISSN: 0021-9746 ---	
A	WO 97 11715 A (AUSTIN RESEARCH INST ;SANDRIN MAURO SERGIO (AU); MCKENZIE IAN FARQ) 3 April 1997 (1997-04-03) ---	
A	APOSTOLOPOULOS V ET AL: "CELLULAR MUCINS: TARGETS FOR IMMUNOTHERAPY" CRITICAL REVIEWS IN IMMUNOLOGY,XX,CRC PRESS, INC, vol. 14, no. 3/04, 1994, pages 293-309, XP002071247 ISSN: 1040-8401 -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 00/00711

B x I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claim 29 is directed at least in part to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☒ Claims Nos.: 8
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
see further information sheet, invention 1

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 8

Claim 8 relates to an extremely large number of possible compounds. Support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compounds claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Moreover, a preliminary search for peptides containing the sequence Pro-Aaa-Pro has given more than 150.000 compounds disclosed in the prior art.

Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely to the compounds disclosed in claims 9-10 and extended to those containing the sequence Pro-Aaa-Pro prepared in the examples and/or listed in claim 15.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 8-10, 20-26 (all complete); 1-3, 15-19, 27-33 (all partially)

Isolated and purified ligands that bind to MUC1 comprising the sequence Pro-Aaa-Pro, method for their isolation, uses in therapy and diagnostics and antibodies binding them.

2. Claims: 4-7, 11-14 (all complete); 1-3, 15-19, 27-33 (all partially)

Isolated and purified ligands disclosed in claim 1, as far as not covered by subject 1, their uses in therapy and diagnostics and antibodies binding them.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 00/00711

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9609411 A	28-03-1996	US 5885577 A	23-03-1999
		AU 3719395 A	09-04-1996
		CA 2200684 A	28-03-1996
		CZ 9700855 A	14-01-1998
		EP 0789783 A	20-08-1997
		JP 10506463 T	23-06-1998
		US 6015561 A	18-01-2000
		ZA 9507989 A	18-04-1996
WO 9218534 A	29-10-1992	AT 159727 T	15-11-1997
		DE 69222956 D	04-12-1997
		DE 69222956 T	09-04-1998
		DK 672063 T	18-05-1998
		EP 0672063 A	20-09-1995
		ES 2111066 T	01-03-1998
		GB 2270078 A,B	02-03-1994
		GR 3025982 T	30-04-1998
		JP 6506927 T	04-08-1994
		US 5591593 A	07-01-1997
		US 6107469 A	22-08-2000
		US 5833943 A	10-11-1998
WO 9711715 A	03-04-1997	AU 7079396 A	17-04-1997
		AU 707223 B	08-07-1999
		AU 7079496 A	17-04-1997
		WO 9711963 A	03-04-1997
		CA 2233447 A	03-04-1997
		EP 0859627 A	26-08-1998
		JP 2000506493 T	30-05-2000